DOCUMENT RESUME

ED 259 501 EC 180 237

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TITLE Facilitating Pragmatic Aspects of Social Language Use with Moderately and Severely Handicapped Children.
INSTITUTION Alameda Unified School District, Calif.; San Francisco State Univ., Calif.
SPONS AGENCY Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE Aug 84
GRANT G008104154
NOTE 46p.; In its: The Socialization Research Project. Final Report, Appendix C, August 1984 (EC 180 236).
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PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Communication Skills; Elementary Secondary Education; Generalization; *Interpersonal Competence; *Severe Disabilities

ABSTRACT

The study was designed to increase the range of conversational topics and the appropriateness of topics discussed by three students (9-14 years old) with severe or moderate handicaps. The participants were trained to initiate social conversations and expand upon the social conversations of others within a training context that closely simulated the natural settings of dining in an elementary school lunchroom or working at a cafeteria job. The training procedure consisted of prompts to initiate new topics of conversation, models of situationally appropriate topics and models of expansions. The correct initiation of novel conversations or appropriate and novel expansions was followed by an enthusiastic discussion of the topic by the trainer. Generalization probes were taken in the natural context with the use of microtape recorders to record the conversational behaviors of handicapped students with their nonhandicapped peers. The results indicated that the students increased their ability to initiate novel and appropriate conversations in the training and generalization settings. (Author/CL)

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Facilitating Pragmatic Aspects of Social Language Use with Moderately and Severely Handicapped Children*

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Running Head: Facilitating Social Language Use

*The research was supported by a Field Initiated Research Grant, #G008104154, Special Education Program, U.S. Department of Education. The authors would like to thank John Healy for his administrative support throughout the project. Requests for reprints can be sent to: Thomas Haring, Department of Special Education, University of California-Santa Barbara, Santa Barbara, CA 93106.

EC180237

Abstract

Social communication training with students who experience severe handicaps has traditionally stressed the production of syntactically and grammatically correct statements. The purpose of the present study was to increase the range of conversational topics, and the appropriateness of topics produced by three students with severe or moderate handicaps. The participants were trained to initiate social conversations and expand upon the social conversations of others within a training context that closely simulated the natural settings of dining in an elementary school lunchroom or working at a cafeteria job. The training procedure consisted of prompts to initiate new topics of conversation, models of situationally appropriate topics and models of expansions. The correct initiation of novel conversations or appropriate and novel expansions was followed by an enthusiastic discussion of the topic by the trainer. Generalization probes were taken in the natural context with the use of microtape recorders to record the conversational behaviors of the handicapped students with their nonhandicapped peers. The results indicated that the students increased their ability to initiate novel and appropriate conversations in the training and generalization settings. The initiations produced in the generalization setting were analyzed to identify the effects of training on the number of different response classes used per session. Issues concerning valid classification of responses into response classes were discussed.

Facilitating Pragmatic Aspects of Social Language Use with Moderately and Severely Handicapped Children

Systematic studies of teaching expressive language to individuals with severe handicapping conditions have largely been concerned with syntatic or grammatic construction. Grammatical forms, i.e., noun pluralization, addition of suffixes, verb transformations, application of prepositional phrases and correct pronoun choice, have been taught using imitation, prompting and differential reinforcement strategies. The generative use of each form has typically been found following the application of a multiple exemplar approach to training (Stokes & Baer, 1977). That is, sufficient examples of each grammatical or syntatic form are presented and trained until the student applies the rule to nontrained members of the response class (Guess, Sailor, Rutherford & Baer, 1968; Baer & Guess, 1973; Clark & Sherman, 1975; Frish & Schumaker, 1974; Rubin & Stoltz, 1974). Guess, Sailor and Baer (1976) developed a language curriculum which extends the training of syntatical forms to contexts where those forms are functionally used. With the ultimate goal of grammatically correct sentences, structures are taught through imitation, correction and the reinforcement of responses which impact the student's immediate environment. Generative responding is produced by repeated exposure to the training stimuli in multiple natural environments. However, few procedures have been evaluated which encourage the spontaneous initiation of language.

More recent linguistic research minimizes the importance of training syntactical forms and emphasizes underlying semantic

relationships (Sailor, Guess, Goetz, Schuler, Utley & Baldwin, 1980). Carr and Kologinsky (1983) demonstrated the acquisition of 10 singly produced signs in autistic children to be used spontaneously as requests for desired objects and actions. Thus, the production of a sign pragmatically served as a request for an object or action. The study emphasized training within incidental learning contexts (Hart & Risley, 1978, 1980) rather than under discrete trial conditions (Koegel, Russo & Rincover, 1977). The participants were taught to act as initiators by systematically reinforcing spontaneous productions of signed requests. As a result, greater spontaneous communication was found both during training sessions and in baseline-maintenance sessions. Incidental teaching has been used by many researchers to promote the generalization of language skills in severely handicapped students (Oiver & Halle, 1982; Schepis, Reid, Fitzgerald, Faw, Van Den Pol & Welty, 1982; McGee, Krantz, Mason & McClannahan, 1983).

The concept of "loose-training" as a facilitator of stimulus and response generalization is related to incidental training because training occurs in natural contexts with natural elliciting cues. Loose training refers to teaching and allowing multiple behaviors in response to one or more related stimuli. Campbell and Stremel-Campbell (1982) provide an example of stimulus generalization of trained language responses following exposure to a wide array of naturally occurring stimulus events which could appropriately signal trained responses. When social language occurs within well-known contexts, the actual accuracy and consistency of grammatical construction may be less crucial if both communicators understand the meaning of an exchange.

The language acquisition literature with severely handicapped children has stressed training for the purpose of satisfying critical needs or gaining desired actions or objects from the environment. Although the more purely social use of language has been of recent interest, few studies have focused on developing procedures to promote language-based social exchanges. Social language studies have paralleled those from the language acquisition literature, in that precise syntatic forms such as greeting responses (e.g., Gaylord-Ross, Haring, Breen & Pitts-Conway, 1984; Haring, 1978) have been stressed. Consequently, few procedures are available to promote the more pragmatic aspects of social communication within familiar, natural contexts (cf., Halliday, 1975). That is, procedures are needed to increase the use of a wider variety of communication functions in order to express a greater range of notions in social contexts. It is presently unknown whether an increase in the range of ideas communicated by a severely handicapped person would be functional in the sense that same-chronologically-aged, nonhandicapped peers would process and socially respond to pragmatically meaningful, but syntactically incorrect social/communicative utterances. When language use is considered in a social context, the reciprocal exchange of utterances is the central defining characteristic. Unfortunately, while the training of syntactically correct initiations has been demonstrated with severely handicapped learners, there are few examples of studies showing turn-taking, reciprocal exchanges or language exchanges beyond two or three semantically related utterances (Baldwin, 1983).

In the present research, social exchanges were taught to persons who already demonstrated considerable social communicative intent, but who had difficulty selecting appropriate topics for social exchanges within specific contexts. In this circumstance, the participants showed a high degree of desire to interact with similar age peers. In fact, using the actual peers within the context to systematically train interaction might prove to be detrimental in terms of encouraging natural, untrained social conversation because peers may assume a teaching role with the handicapped students rather than a more equal peer relationship (Voeltz, 1982).

The purposes of the present study were: (1) to increase the variety of spontaneous social initiations of moderately and severely handicapped individuals in work and lunch settings; (2) to increase the students' ability to spontaneously expand upon social statements initiated by a nonhandicapped peer; and (3) to assess the effects of the training to increase the frequency of initiations and expansions of social conversation on the social behavior of nonhandicapped peers and coworkers.

Method

Participants

Three students from a class for severely handicapped students located on a public elementary school campus were selected to participate in this study. The three students were served in a school program based on a functional curriculum model that included community training or grocery shopping, money handling, restaurant skills and the use of public transportation. The involvement of peers in friendship-based leisure activities and

vocational preparation within both the school and community environments were integral parts of the school program. Language instruction and social skill training were incorporated to the greatest extent possible in all facets of the curriculum.

Prior to the implementation of training, all participants showed either a relative absence or inappropriateness in their social conversation with adults and peers. While all students maintained a high level of receptive and expressive language capabilities (200+ word vocabularies, ability to follow 3-4 step mands given by familiar persons and 9-10 word sentence formation), to a great extent the skills were not used in contextually appropriate conversations. Finally, when nonhandicapped peers initiated a social exchange, the replies by the participants were either brief and unlikely to lead to subsequent interaction, or not appropriate to the conversational context that was introduced.

Mark was a 13-year-old male who was functioning at the moderate to severe range of mental retardation. While his articulation was difficult to understand, he was generally able to make himself understood by repeating statements. Observations by a trained observer prior to the study indicated that his initiations occurred at a high frequency but 80% of the initiations were inappropriate to the context, age inappropriate and repetitive of previously initiated statements. The timing of his verbal initiations often interfered with his and others' work activities. He would consistently greet familiar teachers and peers upon entering a setting; however, he would subsequently repeat greetings in the same setting to the same people. Mark would respond appropriately approximately 80% of the time to

initiations made by familiar adults and 50% of the time to initiations made by familiar peers.

Ann was a 9-year-old, moderately handicapped girl with Down syndrome. Ann initiated greetings 100% of the time toward teachers and familiar adults, but did not greet peers in social and work related settings. Ann consistently responded to adult initiations, while her responses to peer initiations often consisted of giggling or unrelated conversation.

Kim, who was 14-years-old, was considered to be moderately handicapped. She would never initiate toward familiar or unfamiliar peers; however, she occasionally initiated brief interactions with familiar adults. Spontaneous and prompted verbal initiations and responses were often barely audible, resulting in others asking for repetition of utterances. Requests for repetition always resulted in Kim saying "I don't know." Kim never expressed greetings in work or social situations. She would respond appropriately to greetings from others approximately 30% of the time.

Table 1 provides an overview of psychometric evaluations conducted on each participant prior to the beginning of the investigation.

Insert Table 1 about here

The Nonhandicapped Coworkers consisted of a group of normal fifth graders who worked with the handicapped participants in the work and lunch environments. One to three coworkers (depending on the work setting) were present in the work environment and three

to five coworkers sat at the table with a handicapped participant during lunch. All fifth graders were given an opportunity to participate at some time during the school year. Because the jobs were seen as a privilege and a means to leave class early, all fifth graders were interested in participating. New coworkers were randomly selected and trained every three weeks. The training of the fifth grade coworkers (which usually lasted less than 10 min) included suggestions of ways to prompt the handicapped workers if errors were produced on the task. No direct instruction was given regarding appropriate ways to socially interact with the handicapped participants, although approximately 75% of the fifth graders had some prior experience interacting with the handicapped students in the classroom, where strategies to socially interact wih the students during leisure activities had been discussed. In addition, the handicapped and nonhandicapped students frequently interacted at recess.

Trainers and Observers

The training of all three participants was conducted by one individual. The trainer was a recently trained, credentialled teacher of the severely handicapped who had had extensive experience in the use of behavioral training procedures and in conducting behavior analytic research. Four observers were used to score the reliability of coded data from tape recordings, and the accuracy of the written transcriptions of natural interactions. Two of the observers were advanced Masters degree candidates in special education with extensive experience in the recording of behavioral measurements. One observer was an assistant professor in special education who also had extensive

experience in behavioral measurement with handicapped individuals. The fourth observer, a certified public accountant, had no prior experience in the field of education. All observers were trained in the measurement techniques of this study prior to the recording of actual data. Three of the observers were blind to the experimental hypotheses and when treatment conditions were introduced.

Setting

The training occurred for all three participants in an elementary school cafeteria containing 40 lunch tables, a counter to distribute lunches and a window where cookies were sold. Each participant was trained at the lunch table where they normally ate with their nonhandicapped peers and at a work station (either the cookie window or the lunch counter). For Ann and Kim, training occurred in a 6 x 8 m room, which opened to the lunchroom through a window where cookies were sold to students and teachers. For Mark, training was conducted in the cafeteria at the head of the lunch line where hot lunches were dispersed. Mark was to stack empty metal trays to the left side of the lunch line, two m from the work environment of three different nonhandicapped coworkers.

During lunch, all of the nonhandicapped persons in close proximity were familiar to the participants. The nonhandicapped students were seated so that only one handicapped participant was seated at a table. Each table included the same coworkers who worked with the participants.

Procedure

Baseline and generalization probes. During baseline and training sessions the participants were given the cue "What do we

talk about?" prior to entering the work setting. No further instructions, corrections or feedback were given. No observers or trainers were present and no intervention occurred during generalization probe sessions.

Initiation training. A social initiation was defined as any verbal behavior made by one individual which served to begin a purposeful interaction between two people and which led to an acknowledgement from the second party. One or two training sessions in each training setting were completed each day. Training was conducted 30 min before lunch or work on a daily basis. On three out of five days, an additional session was run in both settings either in the morning or in the afternoon. Thus, the participants were exposed to eight training sessions per week. The series of verbal statements indicated for each participant in Table 2 were taught in the following manner. The trainer stood or sat next to the participant, simulating the lunch and work activities of a nonhandicapped peer or coworker, i.e., eating a snack, passing out cookies, handing out lunches, taking money and waiting for students and staff. During simulations, the actual materials for that activity were used. For Mark, initiation training began with a discrimination trial regarding the presence or absence of customers or students, reflecting an appropriate or inappropriate time to initiate conversation with coworkers. A cue was given, such as "There is someone here to get his lunch." If the participant was silent the trainer praised the appropriate behavior. If the participant attempted to initiate conversation with the trainer, the trainer corrected the behavior by explaining that while he was actually working he should not be chatting with

the coworkers. A cue indicating the presence of people was given during 50% of the training trials. The cue "There is no one here" was presented during the remaining trials. In the presence of this cue, Mark was to initiate a conversation with either a trained statement or an appropriate social statement. If no initiation was attempted, the trainer provided an additional cue "What do we talk about?". The cue "What do we talk about?" was given to Ann and Kim to initiate all training trials in both the lunch and work settings. All participants were allowed 15 sec to respond with either a trained statement that had not previously been given in the session or a novel statement appropriate to the context. If after 15 sec the participant had not produced a correct social statement, the trainer prompted a correct response by saying "Say (one of the indicated statements as given in Table 2)". The participant then modeled the correct response. Following a 30 sec delay during which work or eating was simulated, the trainer asked the participant "What else can we talk about?". The participant was required to either emit a different, yet trained response from the response given previously, or produce a novel statement appropriate to the context. The participant was allowed 15 sec to respond, at which time another contextually appropriate response was modeled. The procedure continued until at least three different social topics were discussed within any setting; or a maximum of six different social topics were discussed each session. If a student spontaneously produced a correct response (which included the production of trained statements not previously produced that session, or novel, appropriate statements) the trainer would

enthusiastically discuss the topic with great interest, including asking the student additional questions about the topic. If a response had to be prompted, the trainer immediately continued training by asking "What else can we talk about?" without inclusion of an enthusiastic topic discussion. If the student attempted to initiate an interaction with a statement that had been previously given by the student or prompted by the trainer, the trainer said "Think of something new to say."

Insert Table 2 about here

Statements were treated as correct if they, in the judgment of the trainer, effectively communicated a comment or declaration which was situationally appropriate, regardless of the correctness of the grammar or articulation. The trained statements were selected based on two assessments of normal peer interactions. Initiations were chosen from a list of topic statements that had been gathered during interviews conducted individually with all fifth graders in the school. The interview assessed those conversational topics most favored and most frequently used by the fifth graders in natural social situations. Additionally, measurements were taken during baseline sessions of the present study assessing those topics most often initiated by nonhandicapped peer tutors in the lunch and work settings specifically. Sessions typically lasted 5-10 min.

Expansion training. An expansion was defined as a statement which could potentially serve to prolong an ongoing conversation by either providing or requesting new information regarding that

conversation. This included questions, commands and declarative statements which had a high probability of extending an interaction past the point of the expansion. Questions which merely caused a person to repeat a statement were not considered expansions (e.g., "What?", "Huh?"). Statements which merely repeated sentences or sentence fragments of previously produced statements were not scored as expansions. Finally, statements that merely answered direct questions (e.g., yes or no) were not scored as expansions. Training times, setting simulation and reinforcement contingencies followed the same procedures as during initiation training.

During simulation of work or lunch activities, the trainer, posing as a nonhandicapped peer, emitted a social statement which was to serve as a cue for several possible expansions to be made by the handicapped participant. The initiations and expansion statements selected as stimuli for expansion training were selected following the same process described earlier. The statements were selected to include information which served to add or elicit new related information to the conversation. As an example, for Mark, the trainer would emit a statement often used by nonhandicapped fifth graders, "Did you see CHPs (a popular t.v. show) last night?". Mark was then given 15 sec to respond with one or two trained statements, "No, tell me what happened.", or "No, I rode my bike.", or with an untrained, yet appropriate statement. If no appropriate response was given, the trainer would prompt the correct behavior by saying,"Say (one of indicated responses given in Table 3)". As in initiation training, the participant was allowed to produce the same response only once in a session.

Repetition of a statement resulted in the trainer saying, "Think of something new to say." Each session continued until at least five expansion statements (to five different initiations) were rehearsed. From session to session, the order in which the statements were trained was changed so to discourage rote responding. In addition, the social statements given by the trainer were altered from session to session, such that the syntactical form changed while the meaning stayed the same, or communicated a closely related idea. Table 3 provides a description of the expansion statements trained to each of the participants in response to behaviors within given stimulus classes.

Insert Table 3 about here

Social validity probes. Four tapes collected in two settings during three phases of the present study were played to a group of 44 undergraduate liberal arts/social science majors. The tapes, each two min in length, contained a sample of the language and interactions that occurred in a work and a lunch environment. Samples were randomly selected from the following conditions: 1) baseline in the lunch setting, 2) initiation training in the lunch setting, 3) baseline in the work setting, and 4) expansion training in the work setting. The tapes were described to undergraduates in an introductory education class as language samples of one young man. The students were to listen to each of the four tapes and answer a series of questions. The tapes were presented to the students in a random order. The questions to be answered were: 1) is there a noticeable difference in the quality

of interaction between tapes 1 and 2, and between tapes 3 and 4; 2) in which sample did the person express a greater range of topics; and 3) in which tape does the person seem most competent in social situations.

Experimental Design

For Mark, a multiple baseline across responses (initiations and expansion) design was employed. For Kim and Ann, a multiple-baseline across participants and responses design was used to demonstrate the functional control of the training intervention over: (1) the number of spontaneous initiations of trained and nontrained social statements made toward nonhandicapped peers and/or coworkers during natural lunch and work periods; and (2) the number of expanded statements produced, based on conversational statements made by nonhandicapped persons toward handicapped peers. Baseline probes were taken in both the generalization and training settings until stability in performance was demonstrated in each, at which point initiation training was begun with the first participant. Intervention with the second participant was lagged in as functional control of the intervention over the previous participant's social behavior was determined. After both participants showed changes in initiation reponses, the intervention procedure was sequentially applied to expansion responses.

Measurement

In the generalization settings each participant carried a microcassette tape recorder (2 x 6 x 10 cm) placed inconspicuously in the breast pocket of his/her shirt. Tape recordings were made for 20 min during baseline and intervention sessions. The

recordings were transcribed and coded by the trainer and trained data collector. Each verbal statement was coded as one of the following: NIH--nonhandicapped initiation toward handicapped, HIN--handicapped initiation toward nonhandicapped, HIA--handicapped initiation toward adult, NEH--nonhandicapped expansion of a statement produced by a handicapped person, HEN--handicapped expansion on a statement made by a nonhandicapped peer, HEA--handicapped expansion of an adult's statement. In addition, inappropriate vocalizations were coded and not included as initiations, responses or expansions.

Initiations produced by the handicapped students were analyzed by assigning each initiation to a broader response class which defined the purpose of the initiation. Table 4 presents an overview of the generation of response classes.

Insert Table 4 about here

The process of categorization of initiations into response classes first involved classification based on the function of the statement into one of five broad categories:

Comments were defined as statements concerning some attribute of an event which served to give information about the event to the other person.

Questions were defined as statements concerning an event which served to gain information from the other person.

Requests/Mands were defined as statements produced as a means to achieve behavioral compliance, or as a means to gain access to an object.

Greetings were defined as social statements given when a person first enters a setting.

Terminations were defined as statements (such as "Bye") which serve to end an interaction.

Once a statement was classified according to function, it was further classified as to the nature of the grammatical subject of the statement. The grammatical subject was defined as the receiver or doer of an action, or an object that is described or identified. Specifically, statements were categorized as concerning oneself, another person, food or an object.

Statements were also classified on the basis of the context or the nature of the event communicated. The description of the nature of the event included whether the statements concerned action, location, the time of day, feelings, hunger, possession or description of an object's or event's characteristics.

Finally, the statements were further categorized as to when the event occurred. The timing of events being communicated was categorized as occurring in the past, present or future. To illustrate the system for constructing response classes, the statement "What are you doing after school?" would be classified in the response class titled, Question about Others Future Action. Further examples of response classes wth actual statements from the present investigation are given in Table 5.

Insert Table 5 about here

For each session, the frequency of different response classes produced was calculated and graphed. For each session, frequency counts of the number of response classes were made, and only those

response classes which were new for the session were used to determine the frequency for that day. In addition, a lexicon of each participant's initiations were kept for the entire study. By doing so, the frequency of new response classes produced for the study was determined and graphed for each session.

Changes in occurrence of expansion statements produced by the handicapped participants were analyzed by determining for each session the number of expansion statements which directly followed a nonhandicapped initiation, and in turn were followed by a response or another expansion statement made by a nonhandicapped person. The percentage of HENs emitted in relationship to the number of opportunities for expansion was calculated using the formula:

$$\frac{\#HEN}{\#WIH} \times 100$$

Success in discriminating appropriate times to initiate conversation was recorded for Mark as +/- and calculated as percent correct responding. Spontaneous production of a trained initiation, an expansion statement or the production of a novel appropriate statement was scored as +; no response, a repeated response or a prompted response was scored as -. The percentage of spontaneously produced initiations and expansions was charted using the formula:

$$\frac{\text{\# of spontaneously produced statements}}{\text{Total \# of opportunities to produce statements}} \times 100$$

Interrater Reliability

Reliability measurements were taken for each participant on 30-83% of the generalization data in baseline and training phases.

Four observers scored each transcribed social statement as one of the defined coded descriptors (including all but work-related conversation). Point by point agreement (Kazdin,, 1982) was assessed and the percentage of agreement between the trainer and observer was determined using the formula:

$$\frac{\text{\# of agree - \# of disagree}}{\text{Total}} \times 100$$

For Ann, there was found to be 97.3% agreement for 50% of all baseline sessions, and 96% agreement on 83% of the generalization sessions taken during the initiation training phase. A 99% agreement was found on 50% of Kim's baseline sessions, and 100% agreement on 56% of her sessions recorded during the initiation training phase. Reliability data for Mark indicated 90% agreement on 42% of baseline sessions, 95% agreement on 30% of the sessions from the initiation training phase, and 96% agreement on 30% of the generalization sessions recorded during the expansion training phase.

The reliability of the training data was assessed utilizing an independent observer. Both the trainer and observer scored each spontaneously produced initiation and expansion as to correctness. Point by point reliability was calculated for 22% of the training sessions. The reliability ranged from 84% to 100% with a median of 100%.

Results

Training

Figure 1 displays the training data for Mark. The baseline measurements for the discrimination training indicate that Mark correctly discriminated the presence or absence of students

(indicating the appropriate times to converse) 0% of the time. Once discrimination training was begun, appropriate responding increased to 45% of the given trials, and increased to 100% correct responding by the seventh session of training. Perfect discrimination was maintained for the following four days at which time discrimination training was discontinued.

Insert Figure 1 about here

The baselines for both initiation and expansion responses show that no correct responses were produced toward the trainer within the simulated work and lunch sessions. In fact, under both conditions, Mark did not respond to any of the experimental cues given by the trainer. When initiation training was introduced, correct responses were produced on 40% of the occasions which were structured to cue responding. During the last six sessions of initiation training, Mark was averaging 74% correct responding. After Mark's initiation training data had stabilized, expansion training was introduced. On the eleventh day of expansion training Mark responded correctly every time the trainer initiated a conversation.

The training data for Ann and Kim are given in Figure 2. The baselines for both Ann and Kim indicate that no correct responses were made toward the trainer in either the work or lunch settings. For Ann, once initiation training was begun, she initiated 17% of the time, and steadily increased her percentage of correct responding until she was initiating following over 70% of the trainer's cues during the last three training sessions. For Kim, correct responding increased to 44% immediately following the

introduction of intervention. Her initiations fluctuated around 80% correct for the remainder of intervention with a range between 70 and 100%.

Insert Figure 2 about here

Generalization

Figure 3 shows the initiation data for Mark expressed as the number of different response classes produced each session. The baseline data show that performance fluctuated around a mean of 4.74 different response classes per session. However, as many as 8 different response classes were produced during a baseline session, and as few as 3 were produced during four baseline sessions. When training was introduced in the simulated context, the generalization data showed an immediate increase to 10 different response classes. Figure 3 shows that a mean of 8.23 different initiations per session were produced during initiation training. In terms of overall frequency of initiation, which is not indicated in Figure 3, Mark's data rose from an average of 7.7 per day to an average of 14.2 initiations per day.

Insert Figure 3 about here

Figure 3 also shows the generalization data for Mark's expansions. The expansion data is expressed as percentage of times Mark produced a correct expansion after a coworker had initiated an interaction. The baseline data show a fluctuation around a mean of 10% correct expansions; however, during two sessions Mark correctly expanded upon 29% of the nonhandicapped coworker's initiations. The baseline data also show that on 11

occasions Mark did not produce any situationally appropriate expansions. When expansion training was introduced, Mark's generalization data did not show an appreciable increase from baseline levels until the eighth day of training. Although the mean level of correct expanding rose to only 23% overall during expansion training, by the last five sessions, Mark was correctly expanding upon an average of 45% of the nonhandicapped peer's statements.

Figure 4 shows the generalization data for Ann and Kim. Kim's data shows that she did not initiate a social interaction with a nonhandicapped peer until the 17th session of baseline. Of the two initiations she produced during baseline, one was a request for help ("open it") and the other was a comment about a fallen cookie ("it fell down"). When initiation training was begun, Kim gradually initiated more interactions during the generalization sessions. Although her mean number of initiations was 3.56 during the entire phase, the mean for the last five days was 5.6 new initiations per day. What is not indicated in Figure 4 is that her frequency of initiation (i.e., counting all initiations, not just new initiations per session) also increased substantially from baseline levels: from a mean of .09 to 5.3 initiations per day. In terms of the diversity of Kim's initiations, on an average day she initiated 5.3 interactions, 3.56 of which were not repeats of other response classes already produced that day.

Insert Figure 4 about here

Ann's data (Figure 4) shows a mean of .76 different response classes per day during baseline and a mean of 9 per day during initiation training. In terms of raw frequencies of initiations, Ann produced a mean of 1.3 per day during baseline, and 15 per day during initiation training.

Novelty of Generalized Initiations

The initiation data from the three participants was further analyzed to determine if the training procedure increased the number of new response classes being produced. The number of new response classes each session for Mark is presented in Figure 5. These data were produced by keeping a lexicon of each initiation produced during the study and categorizing each initiation into response classes. Initially during the baseline sessions, many of Mark's initiations counted as new response classes simply because it was the first time a response from the class had been produced. However, once a response class was represented, further responses from that class were not included in these data. Thus, it becomes progressively rarer for a response to be from a new (for the study) response class. By the end of the baseline condition, Mark was usually producing either no or just one new response class per session. When the initiation training was begun, a slight increase in the number of new response classes per day was observed; however, by the end of initiation training, the number of new response classes per day had returned to baseline levels.

Insert Figure 5 about here

Comparable data for Kim and Ann are presented in Figure 6. For Kim, the introduction of initiation training resulted in a

sizeable increase in the number of new response classes per session. Ann's data indicates that the introduction of the initiation training resulted in a rapid increase in the number of new responses classes used, but, as with Mark's data, the number of new classes produced per session had returned to baseline level by the end of the training.

Insert Figure 6 about here

These data indicate that the effects of the training was to infuse new response classes at a higher rate than baseline into the conversations. Although the rate of introducing new response classes had returned to baseline level, the new response classes which were introduced during the initiation training continued to be produced during other sessions throughout the study. This is reflected in the generalization data reported earlier (Figures 3 and 4), in that the diversity in initiations (i.e., the number of different initiations per session) produced by the handicapped students continued at a fairly constant level throughout the study. To summarize, the initial effects of initiation training included an increase in the rate of introduction of new response classes into the conversations. After this initial increase, the number per day of novel response classes for all three participants showed a trend toward returning to the baseline level of introduction of new statements. It is interesting, however, that these new response classes, which were first produced during initiation training, continued to be produced during subsequent sessions, which is reflected by the increased number of response classes produced per day throughout the intervention phase.

Social Validity of Conversation

Tape recordings of sampled social exchanges were played to 44 undergraduates in an introductory education course. In comparing the overall quality of interaction between tapes from baseline conditions to tapes from intervention conditions for Mark, 42 students indicated that the tape from the initiation phase during lunch was superior to the tape from the baseline session during lunch. In comparing baseline data to expansion data during the work context, 38 students indicated that the tape during the expansion training was of a higher quality of interaction. In judging which tape contained a greater range of topics, 42 indicated that the tape during initiation training was superior to the baseline tape in the same context, and 37 indicated that the expansion tape was superior to the baseline tape in the work context. Finally, all of the respondents indicated that Mark sounded more socially competent during the initiation training phase tape than he did during baseline in the lunch context and 43 indicated he sounded more socially competent on the tape made during the expansion training phase than he did during the baseline tape.

Discussion

Mark, Ann and Kim successfully acquired the initiation responses which were directly taught. Within the training and generalization sessions the procedure produced untrained initiations across all three participants. Interestingly, when the participants started to produce novel initiations in training, their first attempts at novel initiations were often closely related to the previously trained statements. For example, Mark

was trained to say "What are you doing in class?" and modified this to say "What are you doing at recess?". The unique aspect of the training procedure in the present study was the use of a loose training paradigm where there was variation in cues from trial to trial as well as variation in acceptable responses. It should be pointed out that the content that was actually trained was a small set of social stimulus and response classes. The effect of organizing training along this conceptual framework was tested with the generalization data. In the present case, the procedure resulted in considerable generalization within natural work and dining settings. The data indicated that the procedure produced greater diversity in the social conversations of the participants. A short-term effect of the training was to increase the level at which new initiation response classes were produced by the students. Although the level of introducing new response classes returned to baseline levels, the diversity of interactions remained higher than baseline levels throughout the study.

This is a preliminary progress report of a study that is still underway. As such, several sets of data are not yet complete. These include the expansion training and generalization data for Kim and Ann. In addition, we have collected considerable social validity data that is still undergoing analysis.

The generalization data for Mark's expansions indicates that by the end of the study he was expanding upon 45% of the nonhandicapped peers' initiations. To judge these data it would be important to know what percentage of statements that nonhandicapped peers typically expand upon. Although we suspect that Mark's data will show that his level of expansions is

appropriate (judging from our subjective impressions after listening to the tapes, and also based on the responses of the undergraduate students), we have collected an additional set of data on the naturally occurring social interactions between nonhandicapped students in identical situations. This data is still being analyzed, but it could potentially provide an important confirmation of the social significance of these data by giving norms by which to judge these data.

Several issues are raised when transcriptions of social interactions are taken and categorical systems are developed to classify social and communication data. Foremost of these issues is that categorical systems inherently impose some theory of interaction on the data (Newson, 1977; Ochs, 1979). This brings to light two issues in regard to the present data. First, the categorical system developed in this study represents the researchers' interpretation of the meaning that the students are trying to communicate. Even if the nonhandicapped students respond to these utterances in ways which essentially correlate with our categorical system, there is no confirmatory evidence that this is, in fact, what was meant by the initiator. In relation to this point, our own data could be further analyzed for instances of attempts to use another statement to more clearly communicate the intended notion when the handicapped person discriminated that the nonhandicapped person did not understand the statement as it was intended. We have not done this. In any case, the frequency of such attempts to "repair" the interaction may be only a fraction of those interactions which were not

interpreted correctly as to the intent of the initiator. In summary, the essential point is that although our system assigns certain meanings to statements (even though peers respond in similar ways to our system) this does not mean that the communication was sent by the handicapped student to purposefully communicate a given statement as we have it classified.

A second and related point is that our categorical system imposes, to some extent, a theoretical view onto the data. We have purposely kept the degree of such "theoretical influence" low. Our system was designed to keep the degree of theoretical inference low by dealing with basically discrete properties. For example, one category developed was 'question about others future action' ("What are you going to do at recess"). We could achieve reasonably high reliability in constructing response classes since observers could readily agree about such properties of the utterance as future time, that it was a question to gain information, and that it was a question regarding another's action. On the other hand, it could be argued that this statement was really serving as an initiation to communicate something like, "I would like to play with you at recess". Such counter arguments could be made (at the expense of high reliability) at numerous points in the transcripts. To summarize, the level of inference that we made about what the student was trying to communicate was kept low. This may reflect a bias on our part toward reliability at the expense of "truth". It may also reflect an adult imposition of meaning onto children's utterances. In any case, it is hoped that reporting such potential influences on our

interpretation of these data will serve to better define the frame of reference with which to view these data.

The goal of the study was to increase the social communicative competence of the participants by promoting increased motivation to think of new initiations that are appropriate to particular contexts and to expand upon the statements of others. The training functioned to increase the student's ability to discriminate contextually appropriate initiations. To speculate a bit, organizing the training into stimulus and response classes may have facilitated this process. This possible facilitation could have occurred because the student was reinforced either for responding to the topic at hand or saying a new but related topic rather than trying to produce syntatically or phonologically correct statements. The organization of training into response classes may have directly or indirectly facilitated this because thinking of new or related responses was reinforced while rotely repeating previously heard or produced statements was not. The utility of teaching social responses in more traditional, massed trial formats, is an empirical question that future investigations can contrast with more dynamic training models.

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Table 1

Psychometric Evaluations for Three Participants

As Indicated by Mental Age Equivalencies

Test Name	Mark	Ann	Kim
Stanford-Binet	NA*	4.25 yrs	NA
Denver Developmental Screening	NA	3.5-4.5 yrs	NA
Peabody-Pic Vocabulary	NA	6.2 yrs	6.6 yrs

*NA = not available

Table 2

Initiation Statements Trained to Three Participants

Participant	Context	Initiation
Mark	Work	What are we having for lunch?
	Work	What are you doing in class?
	Lunch	How old are you?
	Lunch	What are you doing after school?
	Lunch	Do you like this food?
	Lunch	Do you like CHPs (tv show)?
Ann	Work	Hi, how you doing?
	Work	The cookies look good today.
	Lunch	What's for lunch today?
	Lunch	Do you want to trade?
	Lunch	What are you doing at recess?
Kim	Work	Hi, how are you?
	Work	What kind of cookies are we having today?
	Work	What are you doing after school?
	Work	Do you have any brothers or sisters?
	Lunch	I'm having (name of food) today.
	Lunch	Did you watch t.v.?
	Lunch	Goodbye.

Table 3

Train Participants to Expand upon Statements Made by Nonhandicapped Peers

Participant	Context	Stimulus Class	Expansion
Mark	Work	Pick that up, pick that up.	Hold on, I'll do it.
		Come on, stop it.	Don't worry, don't
		Get ready.	worry.
	Work	Hurry up-take it.	Wait a second, don't
		-do it.	panic.
		-come on.	Be patient.
	Work/Lunch	How ya doing?	Great, how are you?
			Alright, how you doing?
	Work/Lunch	Hi!	How you doing?
		Hello	What's up?
		Hey!	What's going on?
	Lunch	Did you see (tv show) last night?	No, tell me what happened.
		Did you watch t.v.?	No, I rode my bike.
	Lunch	Hey, do you want this?	How about a trade?
			Do you hate it?
Ann	Work	There's people in line.	Are you ready?
		I think we have company.	Do you think it'll be busy?
	Work	Hi!	Hi, what's new?
		Hello	Hi, how was lunch?
	Lunch	Do you want some?	Yeah, I'll give you
		Do you want this?	(food) for it.
		Do you want it?	
		Who wants this?	No, do you have anything else?
	Lunch	Are you going to clean up?	Will you help?
		Aren't you done?!	Has the bell rung?

Table 4

Strategy to Code Initiation Response Classes

Function of the Statement	Nature of the Grammatical Subject	Context	Time
Comment	Self	Action	Past
Question	Other	Location	Present
Request/Mand	Food	Time	Future
Greeting	Object	Feeling	
Termination		Hunger	
		Possession	
		Description	

Table 5

Examples of Response Classes

Request/other/action/present	Greetings
Look, look.	Hi.
Eat it, eat it.	Hello.
Will you help me?	Hey buddy.
Let me have it.	Hey.
Here, put over here.	Hey man, what's up?
Will you throw this away.	(name of peer)
Hurry up.	How are you?
Comment/other/action/past	**Question/self/action/present**
Ouch, you hit me.	My job, right?
You took my milk.	Man, I helping, huh?
It not funny guys.	Me put it over here for you?
He has a towel, he washed his hands.	O.K. I sit right here?
	What you (I) supposed to do?
	Hello, can I play?
	You know where I sit?
	Get myself a cookie?
Question/other/descrip/pres	**Comment/other/action/future**
How old are you?	Next time, it's your turn.
What her name?	She gonna tell me why not we gonna eat.
Where do you live?	
Do you have brothers and sisters?	You guys gonna get it.
Do you have a bike?	You play tag at recess.
What your name?	

Figure Captions

Figure 1. Initiation and expansion training data for Mark within simulated work and eating contexts.

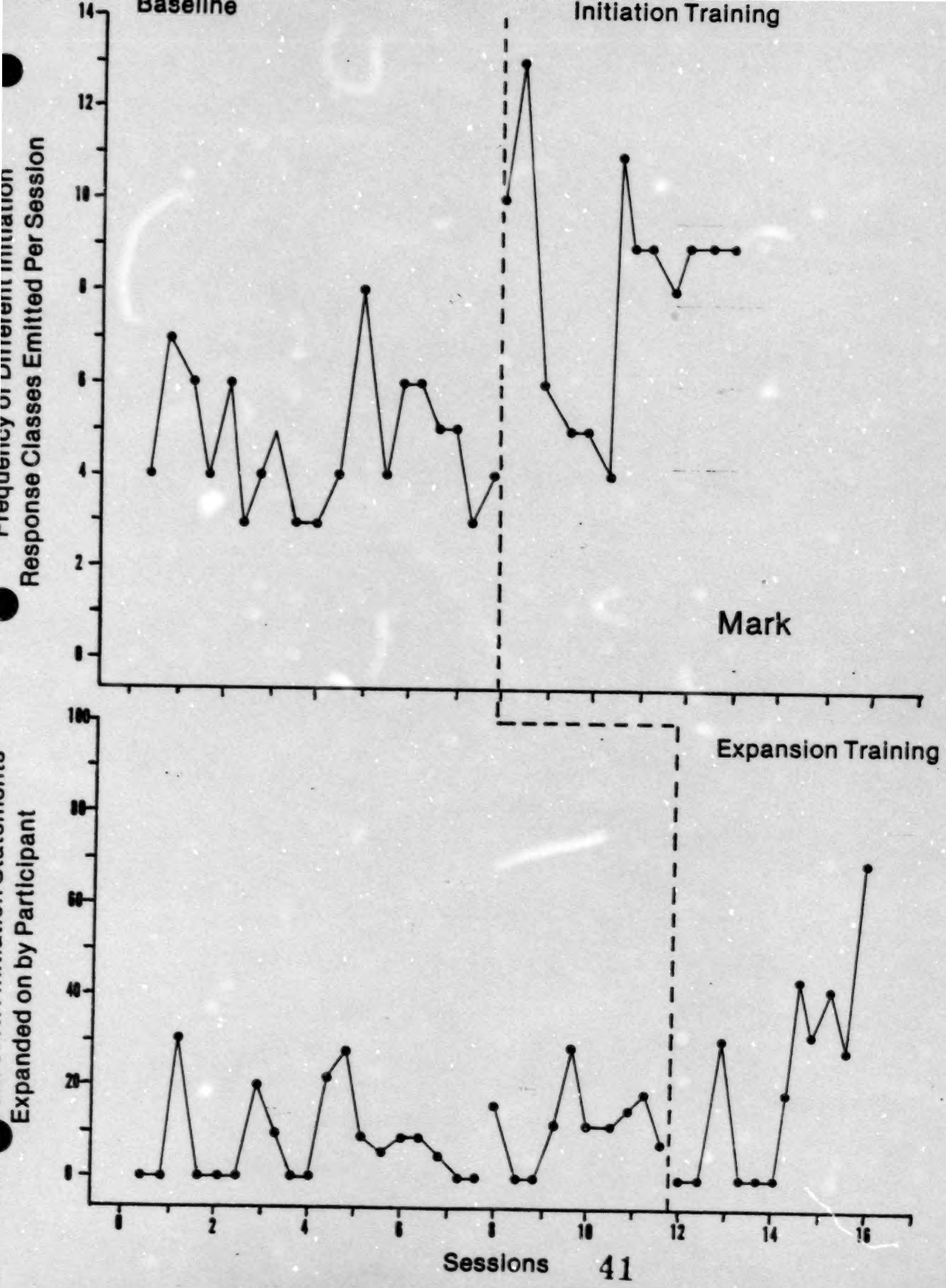
Figure 2. Initiation training data for Ann and Kim.

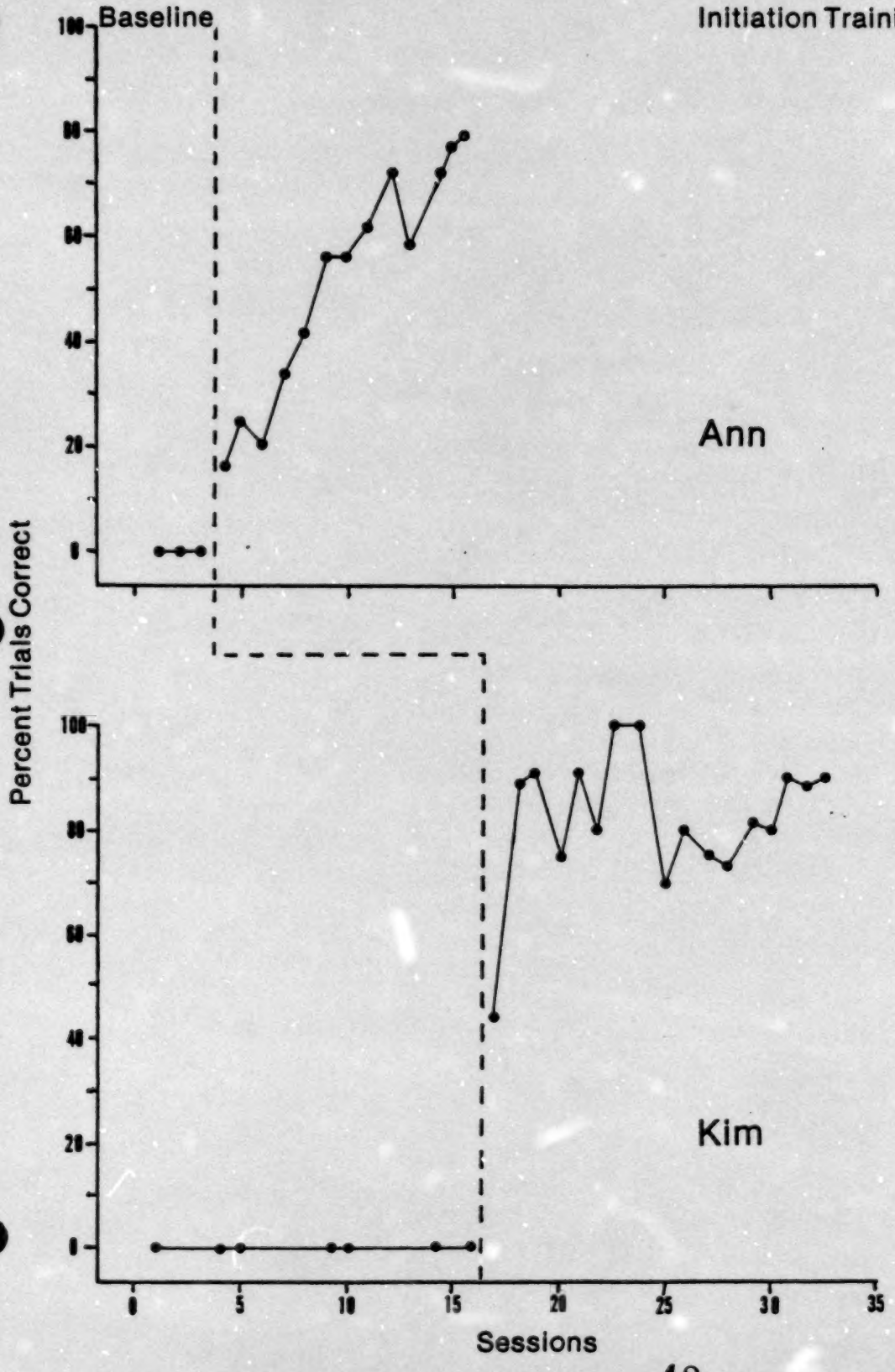
Figure 3. Generalization of Mark's expansions and diversity of response classes.

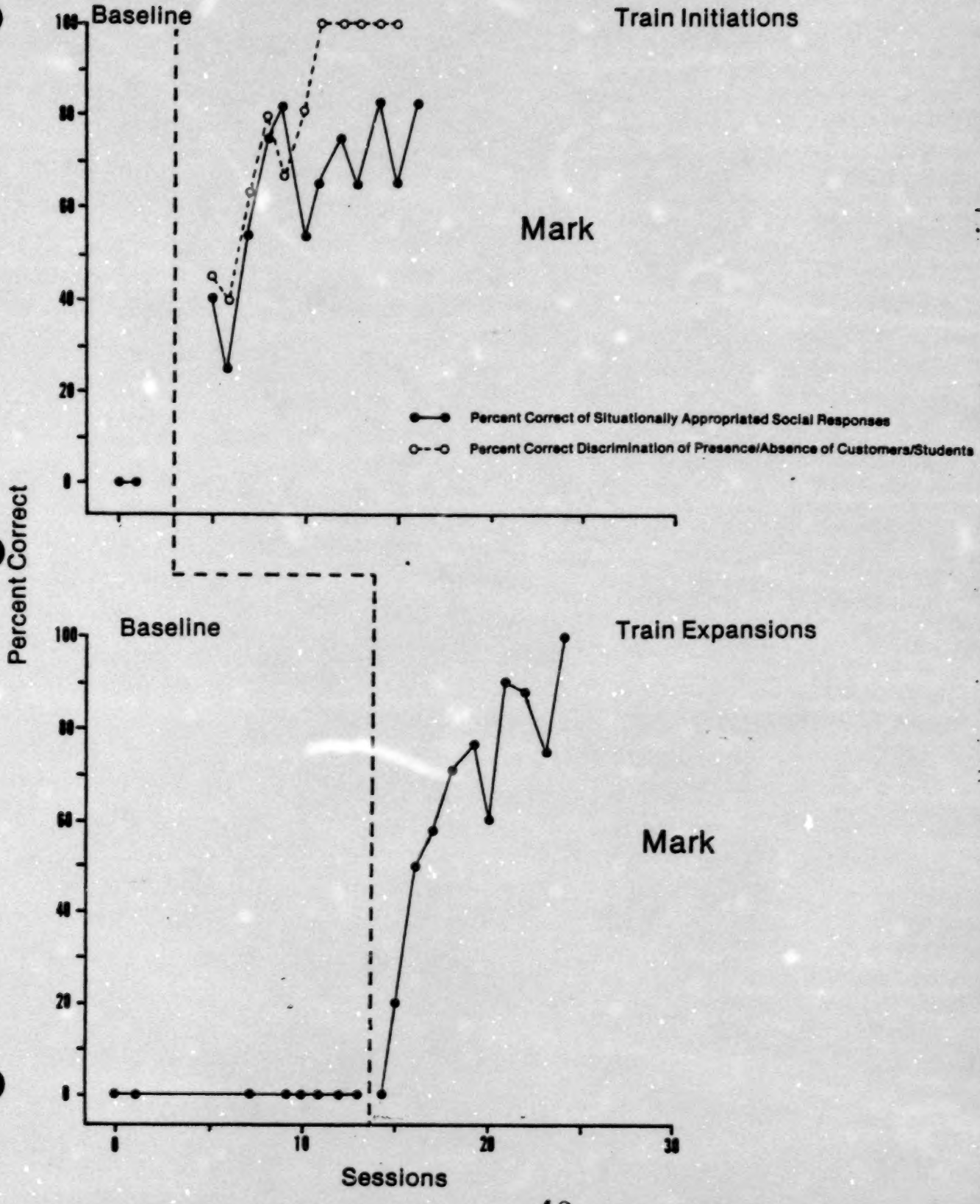
Figure 4. Generalization of diversity of initiation responses for Ann and Kim.

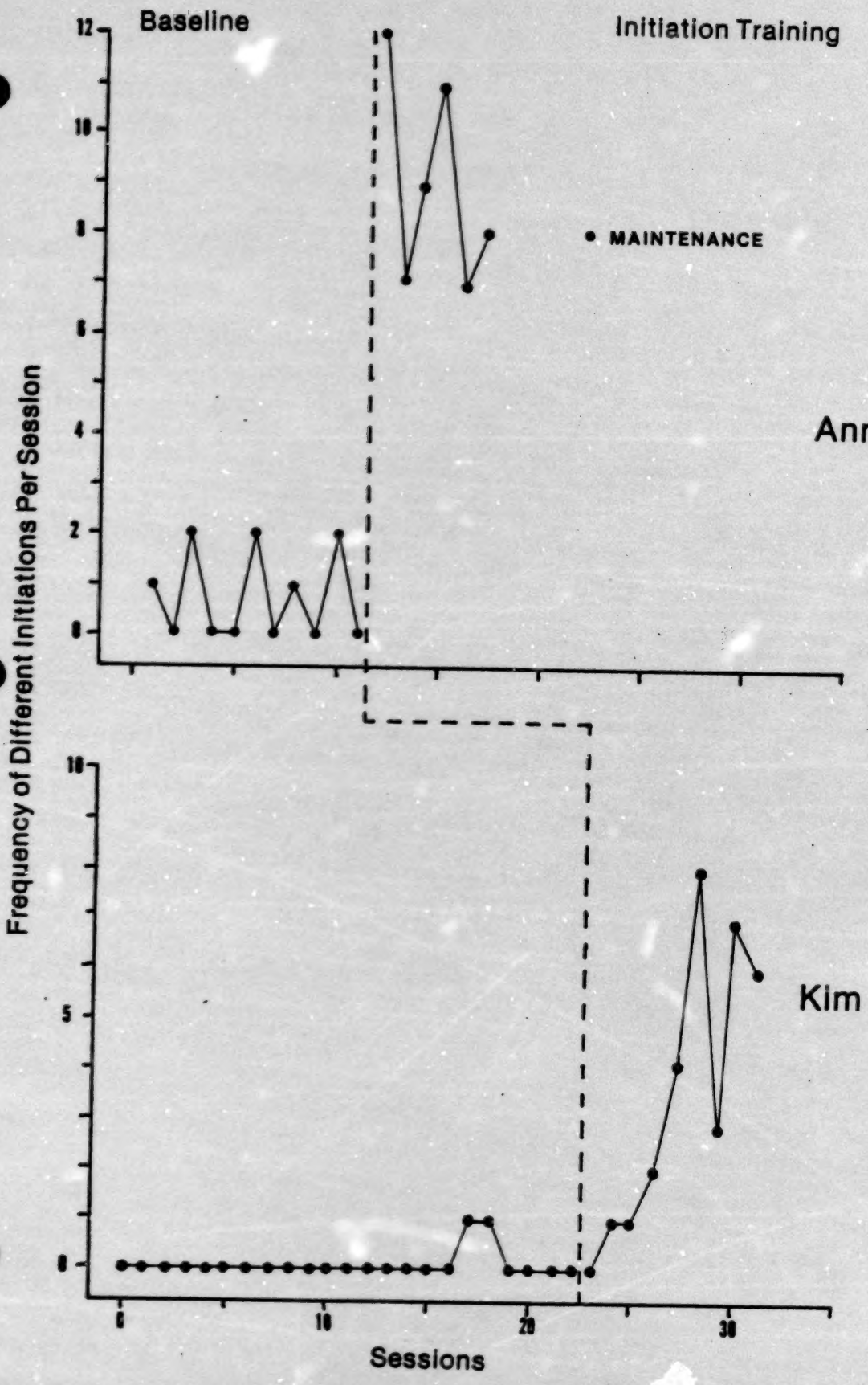
Figure 5. Generalization of number of new response classes not previously produced by Mark.

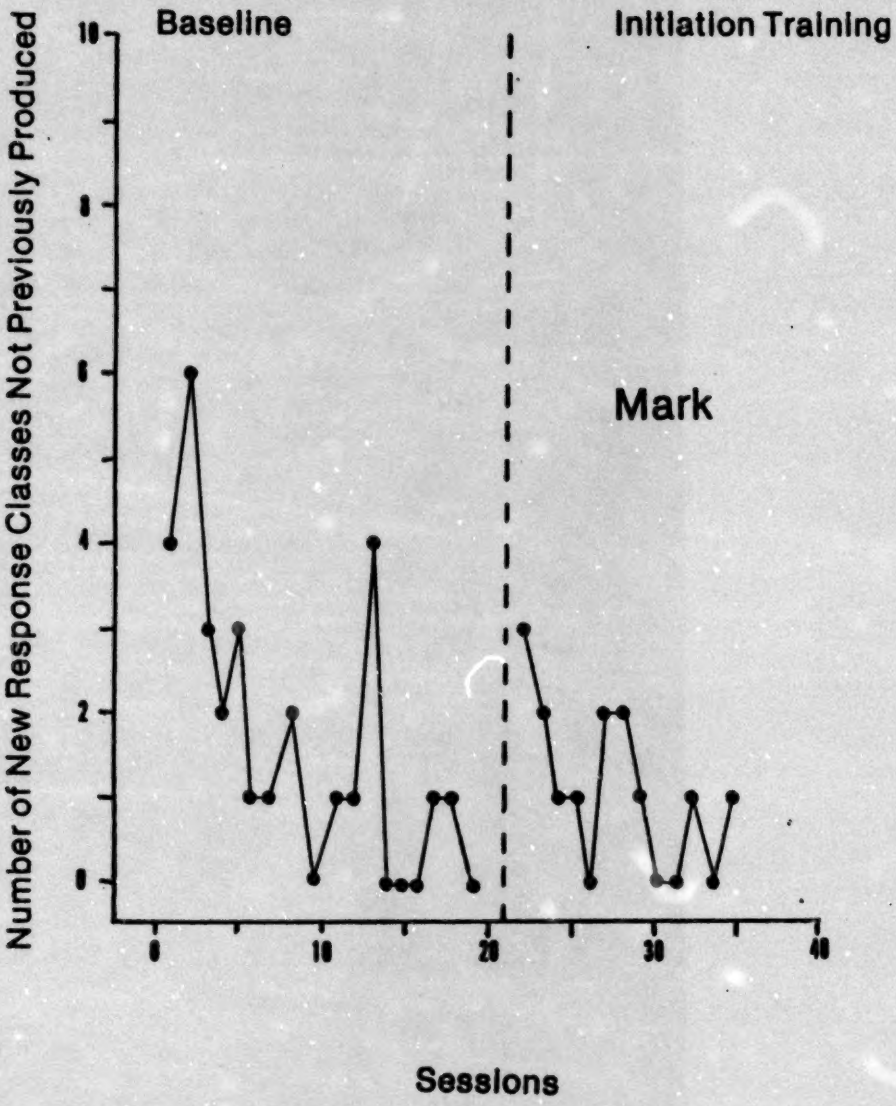
Figure 6. Generalization of number of new response classes not previously produced by Ann and Kim.

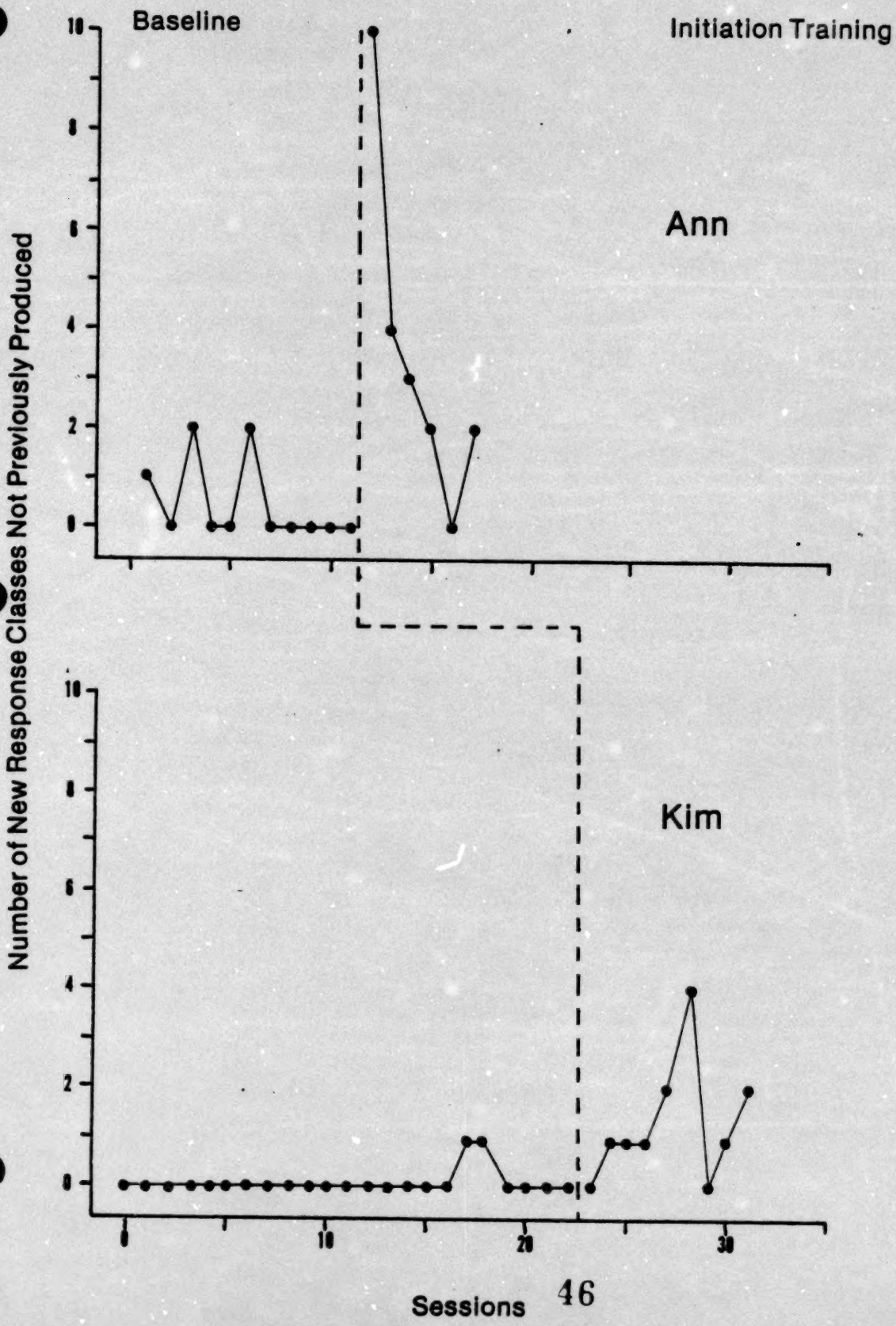

Baseline
Initiation Training
Frequency of Different Initiation Response Classes Emitted Per Session
Mark
Expansion Training
Expanded on by Participant
Sessions


Baseline
Initiation Training
Ann
Kim
Percent Trials Correct
Sessions
100
80
60
40
20
0
0
5
10
15
20
25
30
35


Baseline
Train Initiations
Mark
Percent Correct of Situationally Appropriated Social Responses
Percent Correct Discrimination of Presence/Absence of Customers/Students
Percent Correct
Baseline
Train Expansions
Mark
Sessions


Baseline
Initiation Training
MAINTENANCE
Ann
Kim
Frequency of Different Initiations Per Session
Sessions
12
10
8
6
4
2
0
5
0
10
20
30


Baseline
Initiation Training
Mark
Number of New Response Classes Not Previously Produced
10
8
6
4
2
0
0
10
20
30
40
Sessions


Baseline
Initiation Training
Ann
Kim
Number of New Response Classes Not Previously Produced
Sessions
0
2
4
6
8
10
0
10
20
30